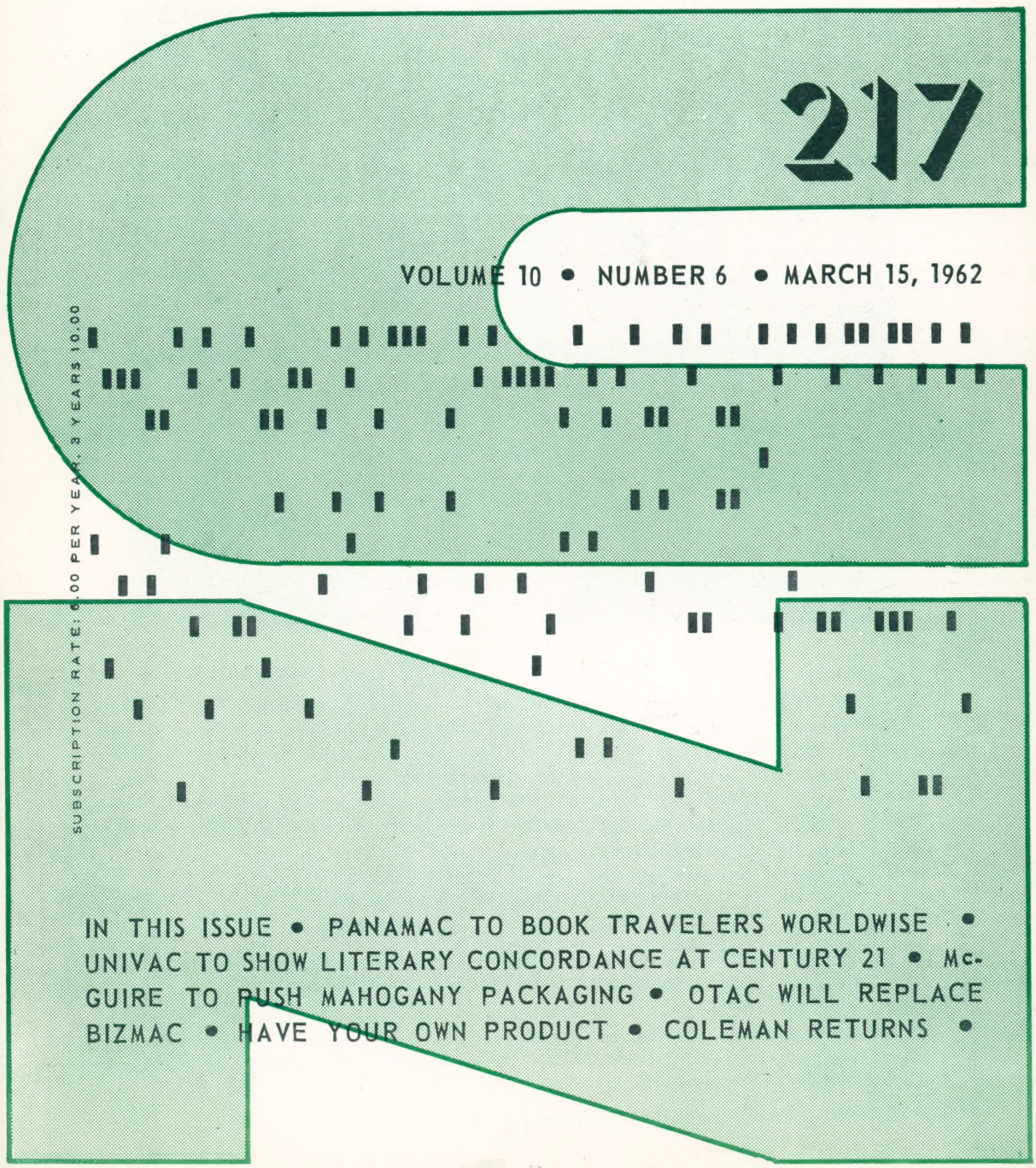
COMPUTING NEWS



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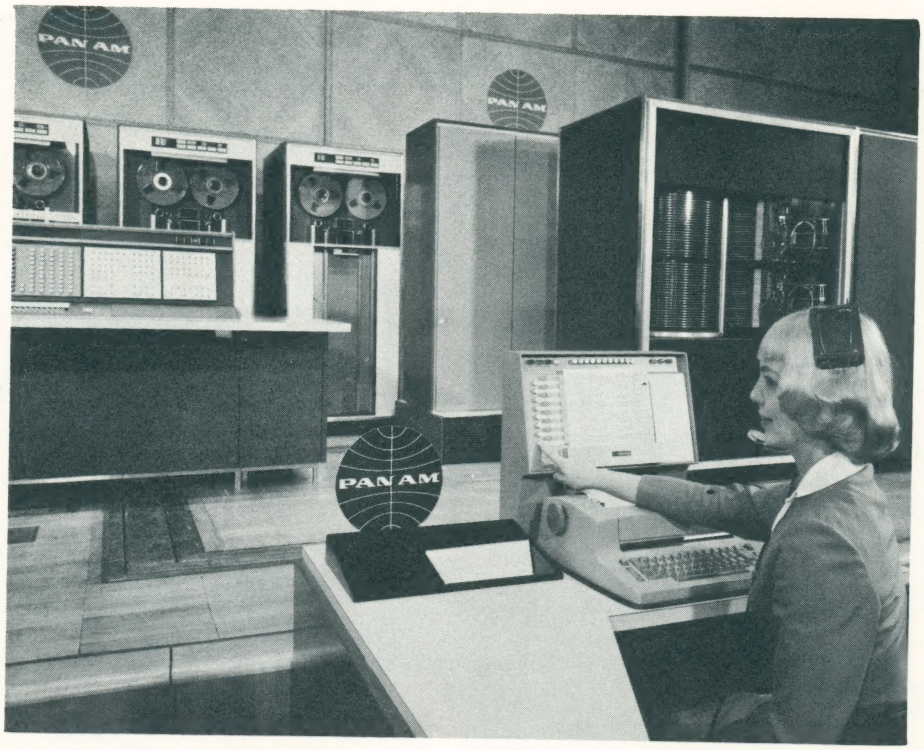

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PAN AMERICAN RESERVATIONS

A contract for an electronic reservations network for Pan American World Airways, was signed on March 12 by Juan T. Trippe, president of Pan American, and Thomas J. Watson, Jr., Chairman of the board of International Business Machines Corporation.

Called PANAMAC, this reservations system will provide swift, accurate and convenient service to the traveling public on all continents and in nearly every country of the Free World. Travelers will be able to get bookings from Pan American offices anywhere in the world in a matter of seconds. The traveler can also get confirmed booking in Pan American's international hotels.

PANAMAC results from six years of study by Pan American and IBM.

PANAMAC will connect 114 cities on six continents with the data processing center in Pan American's new 59-story Home Office building, now under construction in New York City.

The system will expedite Pan American's handling of more than 75,000 daily requests for information and reservations from all over the world, made through its offices or travel agents. These include requests for fare quotations, passenger and cargo transactions, flight information inquiries and Intercontinental Hotel reservations.

In addition to reservations, PANAMAC will do functions such as aircraft engine analysis, sales statistics and forecasts, crew and aircraft scheduling and maintenance planning. Among these accounting and statistical activities are:

Payroll: calculate, issue and register approximately 50,000 checks a month for Pan Am employees all over the world.

Inventory: PANAMAC automatically update and report current levels of Pan American's inventory, which includes 150,000 different parts from nuts and bolts to entire wing assemblies... at more than 100 worldwide locations. The system's computers will determine what items should be reordered or transferred between locations to prevent surplus or out-of-stock conditions.

Passenger and cargo revenue: Each of the six million passenger ticket documents and more than one million airwaybills processed yearly by Pan American will be accounted by the system.

Air route analysis: The system will estimate revenue and costs for each of the Company's global routes over which Pan American aircraft logged more than 100 million revenue miles last year.

Starting next year, more than 600 IBM reservations sets....each linked to the data processing center in Pan Am's Home Office building... will be installed in 31 cities in the continental United States, as well as in Honolulu, San Juan, Montreal, Toronto, Vancouver, London, Paris, Frankfurt and Rome. Pan American locations in more than 70 other cities as widely separated as Fairbanks and Montevideo, or Tokyo and Teheran, will communicate with the PANAMAC computers through conventional transmission equipment until they ultimately receive IBM reservations sets.

The PANAMAC center here, will contain dual IBM 7080 computers.

Equipped with transmission control units that link it on-line to the global communications network beyond its walls, the computing center can respond to inquiries when they are received.

In addition to a combined core storage capacity of 320,000 characters, the computers have access to approximately 400 million characters of information stored in banks of magnetic disk units.

In normal operation one computer will continuously handle reservations transactions while the other performs regular data processing functions such as payroll, general accounting, inventory control and data analysis.

The two 7080s are linked directly by a special data channel; as necessary the second computer can interrupt its off-line data processing to monitor or take over the reservations functions being performed by its twin.

The computer center contains three IBM Tele-processing units---IBM 7750 Programmed Transmission Controls. Pan Am personnel throughout the world are linked via terminals and communication lines to these units.

Operating under control of programs stored in their own core memories, the 7750s receive all messages from incoming communications lines, strip them of transmission codes, translate them into computer language and send them to the computer for processing. Processed data from the computer comes back to the 7750, which re-translates it into transmission code and places it on an outgoing line for routing to the proper terminal.

Each 7750 is capable of parallel operation, so that while it is receiving and assembling messages from each of its incoming lines (by its stored program) it can forward assembled messages to the computer and accept messages from the computer for transmission over outgoing lines.

The first 7750 handles all reservations message traffic from the IBM reservation sets. These sets are linked to terminal interchanges. The terminal interchanges then connect by high-speed voice-grade data channels to the 7750. The second 7750 handles operational and administrative message traffic. It is linked--via low-speed circuits- to conventional transmission equipment throughout the United States and Canada where operational messages originate. The third 7750 is on continuous standby status and can be called into use by the computer when needed.

Eight 1301s disc files each with a capacity of 50 million characters, are linked directly to the central processing unit. Data can be transferred between disc and core at a speed of 90,000 characters a second.

Seventeen tape units, will be used to augment the off-line data processing and store historical records as well as all data to be printed out.

Off-line printing, functions such as tape sorting and editing and production of reports on system performance, will be performed by two IBM 1401 processing systems.

To speed the printing of large volumes of data, two tape units are linked both to the main computer and to the 1401s. With the touch of a button on a control console, a tape unit's allegiance can be transferred instantly from the 7080 to the 1401 and back.

Messages and requests entering the system first are acted upon by a control program stored partially in the computer's core memory and partially in the 7750 which received the message.

This program determines the nature of the message--passenger record, hotel reservation request, cargo space order, etc. --by comparing a code contained in the message against a stored table. It then calls forth from the dksc files for an appropriate operational program, to process the message.

The computer, under control of the operational program, first stores a duplicate of the message in the disc storage to prevent its possible loss. Then it performs the necessary computations.

While it is seeking data from disk storage, other messages can be brought into the computer, processing can take place and fully processed data can be sent back to the 7750 for transmission over the network.

When the computer has processed a message it assembles an answer, including a code indicating where the reply is to be sent and forwards it to the appropriate 7750. This unit checks the address code, translates the message for transmission, and routes it to its destination.

UNIVAC DEMONSTRATES COMPUTER LIBRARY

Electronic Computer techniques for correlating and retrieving pivotal thoughts of history's greatest minds on a variety of subjects were demonstrated on March 19 by the UNIVAC division of Sperry Rand Corporation.

The electronic literary concordance was created under the joint auspices of the American Library Association, Encyclopaedia Britannica, Inc., and UNIVAC for the Seattle World's Fair, Century 21 Exposition.

Fairgoers, upon request, will receive in a matter of seconds a computer prepared copy of the thoughts of any of 74 different authors and philosophers on six different subjects.

Dr. Mortimer J. Adler, Director of the Institute of Philosophical Research, and editor of the "Great Books of the Western World," culled the thoughts of leading authors on the six subjects. The thoughts were fed into the memory of a UNIVAC Solid-State 90 Magnetic Tape Computing System where they form an "electronic library." The computer memory is searched for desired subject matter which can be printed out for reference.

Dr. Adler and J. Presper Eckert, vice president of Remington Rand in attendance at the preview, demonstrated the system.

WOODEN CABINETS FOR COMPUTERS

By Dr. P. Y. Reebe

One day not too long ago, Dr. W. G. McGuire entered my huge, sprawling office. When McGuire comes into your office you sit up and take notice. W. G. McGuire is President of Potts Lumber Company. He is also Acting Head of the Programming Research Section of the Programming Department. How's that for a dual job function?

W. G. McGuire is a self-made man. He is minus a college education; but through hard work, imigination, intelligence and drive, he has climbed the heights at Potts Lumber.

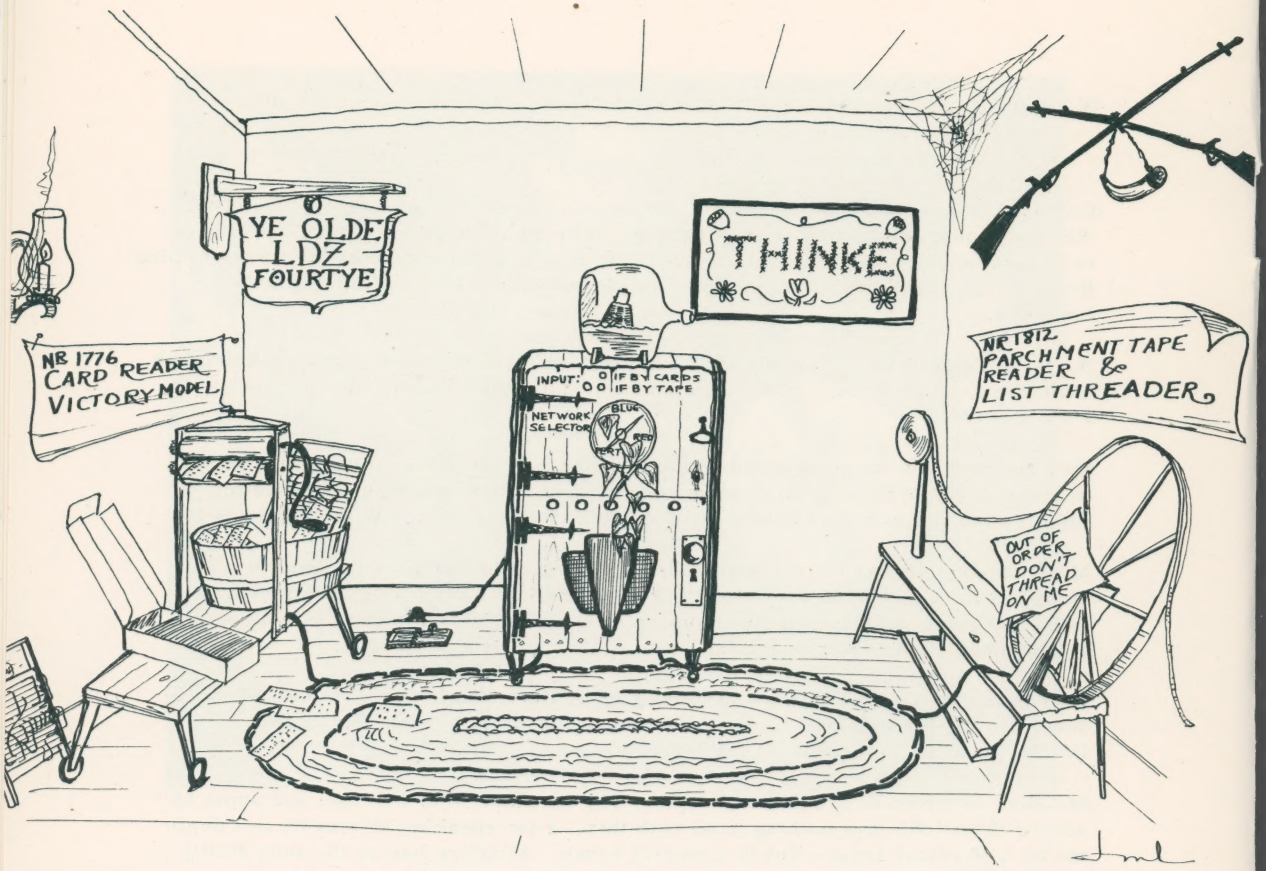
He started off in the programming game, learning computers from the bits up. He quickly demonstrated such all-around ability, however, that he moved into upper corporate echelons before anyone had a chance to ask, "Who's McGuire?"

McGuire, despite his overall success, will not give up his vital interest in computers. Therefore, even though he is head of the company, he retains his position as Acting Head of Programming Research. McGuire, you see, likes to get his hands dirty once in awhile.

Last year, W. G. was highly honored by Potts University, receiving an honorary doctorate for his outstanding contributions to the welfare of the community. Dr. McGuire is very proud of his title.

McGuire is a man of breadth and depth. The fact that he is 6'8" tall and some 56" around the middle has nothing to do with this. I am speaking of breadth and depth not in a physical sense--but in a mental sense. McGuire has an uncanny ability for reaching deep into his complex mind; searching out highly abstract concepts; and applying them to the problem at hand. I could quote you numerous examples, but will cite only three recent cases.

(1) Invariance of Velocity. Last December, Potts Lumber Company was floating a hugh number of logs on the Colorado River. Our normal log traffic control program was giving us some trouble because of extra heavy ice formations. We got into a delicate problem concerning the relative velocity of floating logs at two different points of the river. With his usual brilliance, McGuire came to our rescue. He searched his vast store of knowledge and put his finger on Felix Klein's Erlanger Program of 1870. "Why, let's take the general results of Klein's Program and particularize according to the previous findings of Newton," said the eminent McGuire in his quiet, sure way. "The result is immediate," said McGuire. "Clearly, velocity is invariant under a translation of co-ordinate axes; so our problem is solved." And it was.



(2) Curve-Fitting Problem. As another example of Dr. W. G. McGuire's resourcefulness, consider his solution to this problem. Also during December of last year, we had a technical failure in our telementry equipment on the Colorado. Our radar devices along the banks of the Colorado are supposed to provide us with space-time information on each log as it floats. During the holiday season our radars got glitched badly-presumably as a result of high power consumption in surrounding homes. We were supposed to be getting five velocity figures serially per unit time, and we were supposed to calculate a "smooth" velocity by a least squares curve fit. Well, when the radars went into their glitch state, we were only getting one reading per unit time instead of five. Do you think this stopped McGuire? Helno! McGuire said, "We can solve this easily: let's curve fit to a point!"

(3) Radar Problem. Just three weeks ago, McGuire solved another problem on the Colorado. We were trying desperately to find out if it was raining several miles upstream from where we were standing. Again, McGuire saved the day. He noted thin, black vertical streaks on the under-side of some clouds. "It's raining, all right," stated McGuire. "You can tell by means of visual radar."

So, as you can see, McGuire is right on top of every problem. Therefore, when he enters your office, you sit up and take notice--like I said.

McGuire is never at a loss for finding new markets for Potts Lumber Company. Dr. McGuire has a theory which goes like this: there's going to be a day, not too far in the future, when every home will have a computer." He's tooling Potts Lumber Company for that day.

Dr. McGuire points out that all expensive gadgets start out in industry and wind up in the home. He cites, for example, the case of the typewriter, the case of the adding machine, the case of the voice recorder. He points to special purpose computers which are already in the home; the washing machine, the refrigerator, the build-in oven, the thermostat. It's simple logic to McGuire that the woman in the kitchen needs a control device to tie these other equipments together. And he sees an LDZ-40 right in the middle of the picture.

McGuire knows one thing, however; he knows this from his wife. The LDZ-40 had better be in a beautiful cabinet--a wooden cabinet. The LDZ-40 had better be a beautiful piece of furniture. The mahogany is what will count--not the drum access time.

So McGuire is going to build two separate wooden cabinets for the LDZ-40: one in Danish Modern, the other in Early American. As a matter of fact, to show how resourceful McGuire really is, he's remodeling some old unsold radio set cabinets from the 1930's and using those for his Early American version.

11110

BIZMAC WILL GO

The Ordnance Tank-Automotive Command (OTAC), Detroit, Michigan, will replace its RCA BIZMAC 1 system, which has been operating since 1956, with an RCA 501/301 configuration by 1 July 1962.

The new configuration will include: two 501 systems, each having a 503 computer, 81 thousand characters of memory and using 66 thousand characters per second tapes and two 301 systems, one having a 303 computer with 10 thousand characters of memory, the other having a 304 computer with 20 thousand characters of memory and both using 66 thousand characters per second tapes. One of the 503 computers, which belongs to the government, has been operating in tandem with the BIZMAC since 1 July 1961. The 301 systems will be used for input and output to the 501 systems and to sort. Both 301 systems will have a 1000 line per minute printer.

RCA will start a phased delivery during April 1962, completing it in June 1962. By 1 July 1962 the whole system will be operating.

A prime use of the Automatic Data Processing System (ADPS) will be in carrying out OTAC's responsibility for repair parts supply to more than 1,000,000 vehicles located around the world.

11110

A CHALLENGE TO THE "DO-IT-YOURSELFER" IN THE SPACE AGE

By Robert L. LaFara

How would you like to do something new and different, something that no other human has ever done before? Well, here is your opportunity. No gimmicks, no costs, no special equipment necessary. Are you excited? Read on.

Hold on to your hat, get your pencil and paper, here it is. How would you like to be given a pair of ten digit numbers that have never been multiplied one by the other? You could be the first person to witness the product. Sound mundane, too hard, unlikely? Not so! Even you may select the factors. Why? Because there are so many combinations of factors that only a small fraction of the possible products have ever been computed.

In order to determine the probability that a given set of factors have already been multiplied, we need only find the fraction P=X/N. Where X is the total number of different products that may be computed. (This also assumes that all sets of factors are equally likely.)

Now, for ten digit factors, N is approximately 5×10^{19}. Certain assumptions must be made to obtain X. First, let us exclude all large scale computers since the results of their multiplications are seldom seen by human eyes and furthermore, any such products are usually rounded before being tabulated. Also exclude multiplications done by hand because of the length of time required to obtain a single product (5 to 10 minutes). Multiplication by logarithms cannot be included since the results are only approximate. This leaves only desk calculators (such as Fridens, Marchants and Monroes) with ten digit keyboards to be considered. If it were possible to determine the number of twenty digit products already obtained by each such machine during its lifetime, we could sum these and obtain the total number of these products. However, we would have no assurance that these were all different. Nor could we make a reasonable guess as to how many were different.

Since the above problem is too difficult to solve, let us solve a different problem. Suppose there are n desk calculators, each of which has been in existence T years. Further, let us assume that each has been in use for 2000 hours per year for its entire life. Also that each operator is now and has been working on different sets of multiplications, producing products at the rate of 20 per minute. Now we may compute X by the formula:

$$X = n \times R \times H \times T$$

where R is the rate per hour and H is the number of hours used per year and the other symbols defined as above. Assuming $n = 10^7$ and T= 60 years,

$$X = 10^7 \times 1200 \times 2000 \times 60 = 1.44 \times 10^{15}$$

$$P = \frac{1.44 \times 10^{15}}{5. \times 10^{19}} \doteq \frac{3}{100,000}$$

All factors used in computing X are probably too large by at least a factor of two. Hence, the actual probability may be as low or even lower than 10^{-6}.

Convinced? If you don't have a desk calculator available, do it by hand but don't miss this opportunity to be the first at something. However, you had better not try 9977553311 x 9977553311 as I have already done it and the answer is 99551570093847062721.

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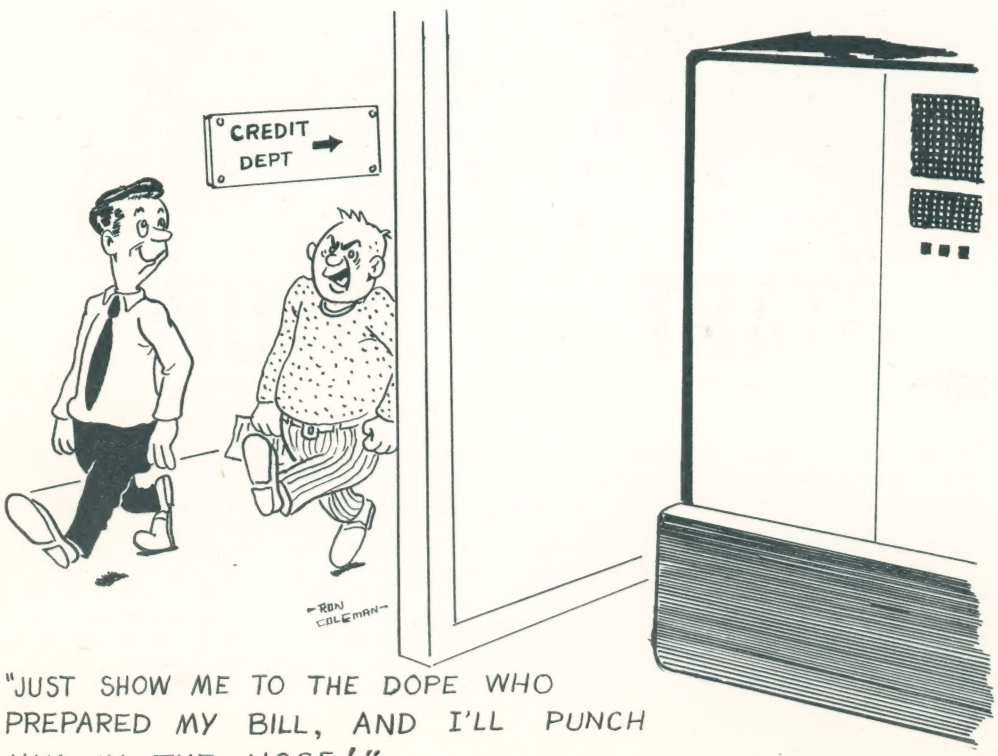
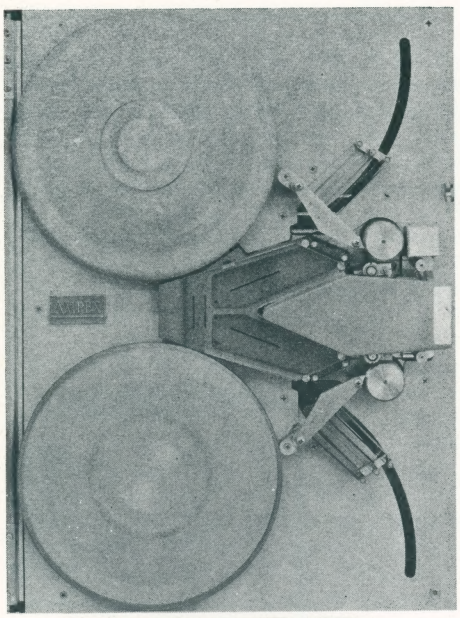
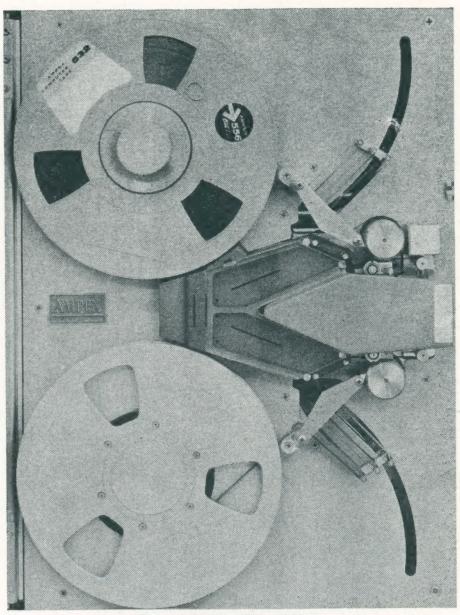


"JUST SHOW ME TO THE DOPE WHO PREPARED MY BILL, AND I'LL PUNCH HIM IN THE NOSE!"



START:

3.3 milliseconds



STOP:

1.8 milliseconds

The new Ampex TM-4 digital tape handler beats start times of previous medium speed transports by 2.7 milliseconds. Stop times by 3.2 milliseconds. And the tape travels only .162″ to .203″ to reach 75 ips. Only .030″ to .100″ to come to a complete stop. New vacuum chambers assure that these start/stop times remain stable. Even under the most rigorous programs. The TM-4 is also easier, gentler on your tape. A new tape guiding system, uniform tape tension and speed limits on the servo system prevent tape abuse. The result: tape life is quadrupled. The TM-4 operates at 75, 60 or 37½ ips. And has a bit packing density of 200 to 556 bpi. The reliability of this new tape transport has been proven with exhaustive pre-testing. (It requires minimum maintenance. And it's easily accessible from the rear.) With these features, the TM-4 is destined to become the standard by which all other medium speed tape handlers are judged. That's why it bears the name Ampex. Write for specifications. Ampex Corp., Computer Products Co., 934 Charter St., Redwood City, Calif.

AMPEX